Math Common Core Spirals

| **Domain** | A+B/C | *Expressions & Equations* | *EE* |

Grade *6*   *Apply and extend previous understandings of arithmetic to algebraic expressions.*

Standard 1   CC.6.EE.1 Apply and extend previous understandings of arithmetic to algebraic expressions. Write and evaluate numerical expressions involving whole-number exponents.

Grade *6*   *Apply and extend previous understandings of arithmetic to algebraic expressions.*

Standard 2   CC.6.EE.2 Apply and extend previous understandings of arithmetic to algebraic expressions. Write, read, and evaluate expressions in which letters stand for numbers.

Grade *6*   *Apply and extend previous understandings of arithmetic to algebraic expressions.*

Standard 2a   CC.6.EE.2a Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation "Subtract y from 5" as $5 - y$.

Grade *6*   *Apply and extend previous understandings of arithmetic to algebraic expressions.*

Standard 2b   CC.6.EE.2b Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. For example, describe the expression $2(8 + 7)$ as a product of two factors; view $(8 + 7)$ as both a single entity and a sum of two terms.

Grade *6*   *Apply and extend previous understandings of arithmetic to algebraic expressions.*

Standard 2c   CC.6.EE.2c Evaluate expressions at specific values for their variables. Include expressions that arise from formulas in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = 1/2$.

Grade *6*   *Apply and extend previous understandings of arithmetic to algebraic expressions.*

Standard 3   CC.6.EE.3 Apply and extend previous understandings of arithmetic to algebraic expressions. Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression $3(2 + x)$ to produce the equivalent expression $6 + 3x$; apply the distributive property to the expression $24x + 18y$ to produce the equivalent expression $6(4x + 3y)$; apply properties of operations to $y + y + y$ to produce the equivalent expression $3y$.

Grade *6*   *Apply and extend previous understandings of arithmetic to algebraic expressions.*

Standard 4   CC.6.EE.4 Apply and extend previous understandings of arithmetic to algebraic expressions. Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions $y + y + y$ and $3y$ are equivalent because they name the same number regardless of which number y stands for.

Math Common Core Spirals

Grade *6*   *Reason about and solve one-variable equations and inequalities.*

Standard
5

CC.6.EE.5 Reason about and solve one-variable equations and inequalities. Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.

Grade *6*   *Reason about and solve one-variable equations and inequalities.*

Standard
6

CC.6.EE.6 Reason about and solve one-variable equations and inequalities. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

Grade *6*   *Reason about and solve one-variable equations and inequalities.*

Standard
7

CC.6.EE.7 Reason about and solve one-variable equations and inequalities. Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.

Grade *6*   *Reason about and solve one-variable equations and inequalities.*

Standard
8

CC.6.EE.8 Reason about and solve one-variable equations and inequalities. Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.

Grade *6*   *Represent and analyze quantitative relationships between dependent and independent variables.*

Standard
9

CC.6.EE.9 Represent and analyze quantitative relationships between dependent and independent variables. Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.

Grade *7*   *Use properties of operations to generate equivalent expressions.*

Standard
1

CC.7.EE.1 Use properties of operations to generate equivalent expressions. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

Grade *7*   *Use properties of operations to generate equivalent expressions.*

Standard
2

CC.7.EE.2 Use properties of operations to generate equivalent expressions. Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, $a + 0.05a = 1.05a$ means that "increase by 5%" is the same as "multiply by 1.05."

Math Common Core Spirals

Grade *7*   *Solve real-life and mathematical problems using numerical and algebraic expressions and equations.*

Standard
3

CC.7.EE.3 Solve real-life and mathematical problems using numerical and algebraic expressions and equations. Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations as strategies to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27

Grade *7*   *Solve real-life and mathematical problems using numerical and algebraic expressions and equations.*

Standard
4

CC.7.EE.4 Solve real-life and mathematical problems using numerical and algebraic expressions and equations. Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

Grade *7*   *Solve real-life and mathematical problems using numerical and algebraic expressions and equations.*

Standard
4a

CC.7.EE.4a Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, The perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

Grade *7*   *Solve real-life and mathematical problems using numerical and algebraic expressions and equations.*

Standard
4b

CC.7.EE.4b Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example, As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.

Grade *8*   *Work with radicals and integer exponents.*

Standard
1

CC.8.EE.1 Work with radicals and integer exponents. Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{(-5)} = 3^{(-3)} = 1/(3^3) = 1/27$.

Grade *8*   *Work with radicals and integer exponents.*

Standard
2

CC.8.EE.2 Work with radicals and integer exponents. Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.

Grade *8*   *Work with radicals and integer exponents.*

Standard
3

CC.8.EE.3 Work with radicals and integer exponents. Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. For example, estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9, and determine that the world population is more than 20 times larger.

Math Common Core Spirals

Grade *8*   <u>*Work with radicals and integer exponents.*</u>

Standard
4

CC.8.EE.4 Work with radicals and integer exponents. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.

Grade *8*   <u>*Understand the connections between proportional relationships, lines, and linear equations.*</u>

Standard
5

CC.8.EE.5 Understand the connections between proportional relationships, lines, and linear equations. Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

Grade *8*   <u>*Understand the connections between proportional relationships, lines, and linear equations.*</u>

Standard
6

CC.8.EE.6 Understand the connections between proportional relationships, lines, and linear equations. Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.

Grade *8*   <u>*Analyze and solve linear equations and pairs of simultaneous linear equations.*</u>

Standard
7

CC.8.EE.7 Analyze and solve linear equations and pairs of simultaneous linear equations. Solve linear equations in one variable.

Grade *8*   <u>*Analyze and solve linear equations and pairs of simultaneous linear equations.*</u>

Standard
7a

CC.8.EE.7a Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).

Grade *8*   <u>*Analyze and solve linear equations and pairs of simultaneous linear equations.*</u>

Standard
7b

CC.8.EE.7b Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Grade *8*   <u>*Analyze and solve linear equations and pairs of simultaneous linear equations.*</u>

Standard
8

CC.8.EE.8 Analyze and solve linear equations and pairs of simultaneous linear equations. Analyze and solve pairs of simultaneous linear equations.

Math Common Core Spirals

Grade *8*

Analyze and solve linear equations and pairs of simultaneous linear equations.

Standard
8a

CC.8.EE.8a Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.

Grade *8*

Analyze and solve linear equations and pairs of simultaneous linear equations.

Standard
8b

CC.8.EE.8b Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6.

Grade *8*

Analyze and solve linear equations and pairs of simultaneous linear equations.

Standard
8c

CC.8.EE.8c Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.